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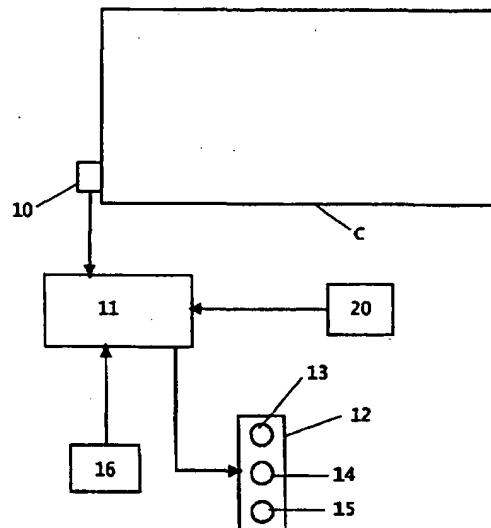
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(54) Abstract Title

Vehicle security system

(57) A security system for a goods vehicle C comprises means for verifying the geographical location of the vehicle and means 10,11 registering whether a compartment of the vehicle has been accessed, responsive to the location verifying means 20 to determine whether or not the vehicle is within an authorised location, programmed into microprocessor 11 using keypad 16, when access occurs. Following sealing or locking of the compartment at one authorised location, the registering means 10,11 indicates with indicator means 12 the compartment access status in one of two states corresponding to either maintenance or loss of compartment integrity since the last authorised access, on arrival at its next authorised location. This indication may be made either automatically or in response to an enquiry made by an operator. The location verifying means 20 may comprise a GPS receiver, or may communicate with a radio communications network to receive signals indicating vehicle location. The indicator means may also indicate a warning if more than one compartment opening occurs at one location, indicating possible tampering by an unauthorised person.

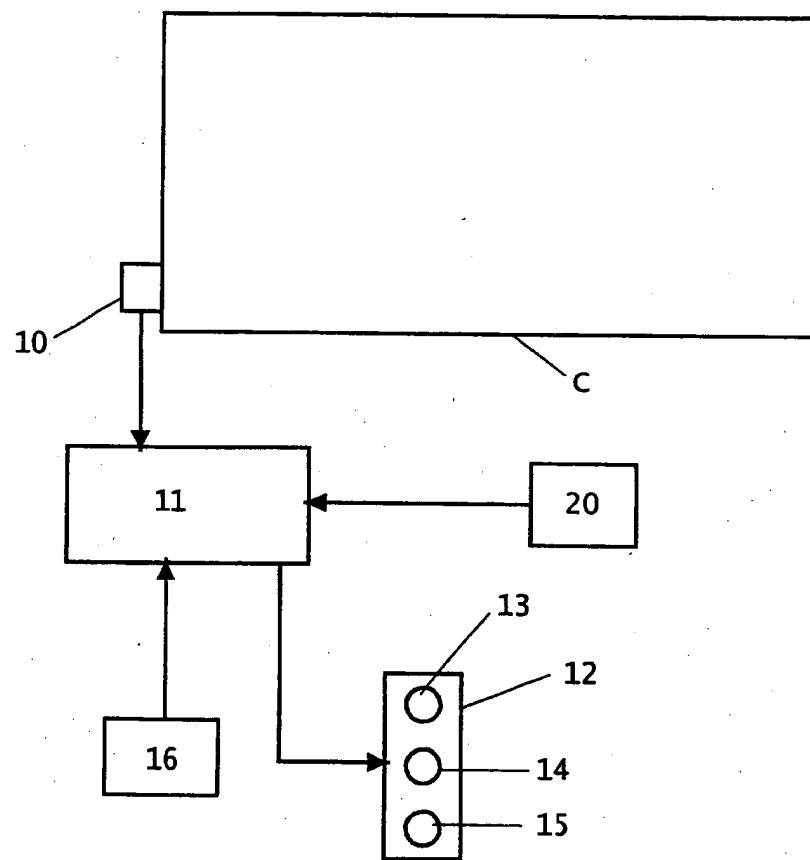
Figure 1



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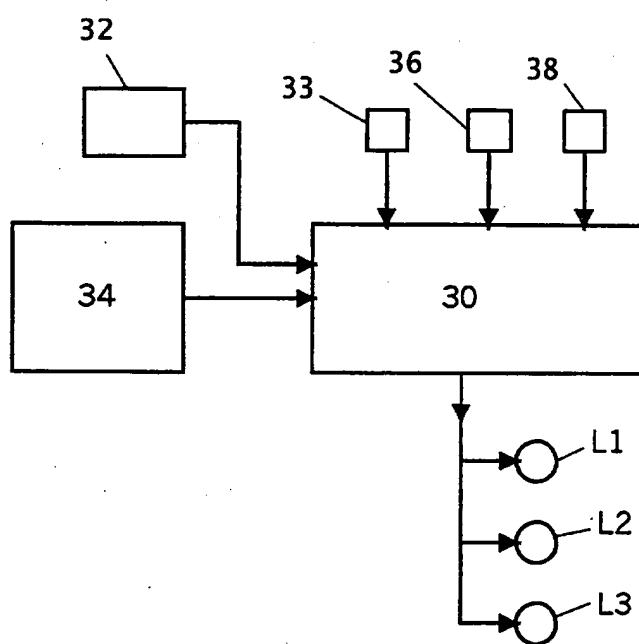
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Figure 1



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Figure 2



**VEHICLE SECURITY SYSTEM**

This invention concerns a vehicle security system and, more particularly, a system for a commercial vehicle used for deliveries at more than one location.

Systems are known where the doors of a commercial vehicle are locked by means which can only be released when the vehicle is positioned at predetermined locations as determined by a microprocessor pre-programmed with the coordinates of those locations and receiving the coordinates of the position of the vehicle at any time by means of the Global Positioning System (GPS).

Such systems have various shortcomings. Firstly, it is not possible to open the doors of the vehicle when it is not positioned at one of the predetermined locations as might be desirable in the event of accident or fire. Secondly, there is nothing to prevent illicit opening of the doors for the purposes of theft or contamination of the goods within the vehicle a second time at a predetermined location, remembering that any such location must be at least as large as the sensitivity of the GPS, say a 100 m square.

It is an object of the present invention to provide a vehicle security system which overcomes the difficulties aforesaid.

According to one aspect of the present invention there is provided a security system for a goods delivery and/or collection vehicle having a goods receiving compartment, said security system monitoring and/or controlling access to the compartment and comprising means for verifying the geographical location of the vehicle and access status-registering means responsive to the location verifying means

for determining whether or not the vehicle is within an authorised location and for indicating the access status of the compartment.

According to a second aspect of the present invention there is provided a vehicle security system comprising an indicator means, a microprocessor, means which delivers a signal to the microprocessor each time the doors of the vehicle are opened or unlocked to enable opening, the microprocessor being programmable with the coordinates of locations where opening of the vehicle doors is permitted, tracking means for updating the microprocessor with the coordinates of the position of the vehicle, the microprocessor being programmed to operate indicator means whenever the doors of the vehicle are opened or enabled for opening other than at a permitted location.

The microprocessor may also be programmed to operate said indicator means if the doors of the vehicle are opened or enabled for opening more than once at a permitted location.

The coordinates of a permitted location may be comprised by the post code thereof.

The post codes may be input to the microprocessor in an encrypted form.

The microprocessor may include means for converting data such as latitude and longitude or Ordnance Survey grid references to the related post codes.

In one embodiment of the invention, the indicator means may comprise three lamps, a first being illuminated when the doors are opened or enabled for opening for a first time at a permitted location, a second being illuminated when the doors are opened or enabled for opening for a second time at a permitted location and the third being illuminated when the doors are opened outside of a permitted location.

Further aspects and features of the invention will be apparent from the following description, given by way of example only, of typical embodiments of the invention and in the accompanying claims. In the drawings:

Figure 1 is a diagrammatic view of one embodiment of the invention; and

Figure 2 is a diagrammatic view of a second embodiment.

Referring now to Figure 1, it will be seen that a container wagon "C" has locking means 10 for securing the doors giving access to its interior. A microprocessor 11 is adapted to receive a signal from the locking means 10 each time it is released to enable the doors to be opened. An indicator means 12 comprising three lamps, one red 13, one amber 14 and one green 15, is provided and controlled by the microprocessor 11. A keypad 16 may be used to pre programme the microprocessor 11 with the coordinates of locations where access to the interior of the wagon "C" is permitted. The coordinates comprise the post codes for the permitted locations but they are input in encrypted form to prevent the unauthorised addition of a further permitted location.

The microprocessor 11 is repeatedly or continuously updated with the position of the wagon "C" by a tracking system such as global positioning system 20. The microprocessor 11 is programmed to include a look-up table to convert signals from the system 20 which may comprise readings of latitude and longitude or Ordnance Survey grid references into post codes.

The microprocessor 11 is programmed to operate the indicator means in the following manner. The green lamp 15 is illuminated after release of the locking means 10 at a permitted location. The amber lamp 14 is illuminated if the locking means 10 is released for a second time at any permitted location. The red lamp 13 is illuminated if the locking means 10 is released at any position other than at a permitted location or

more than twice at a permitted location. All of the lamps remain illuminated until cleared by input of a secret code by the keypad 16.

In use, when the wagon "C" leaves its warehouse or distribution depot, an authorised person inputs the permitted locations where deliveries are to be made. Should the wagon "C" arrive at any such location with the red lamp 13 illuminated - indicating unauthorised opening for theft or contamination - delivery may be refused or further enquiries made before delivery is accepted. Should the wagon "C" arrive with the amber lamp 14 illuminated, the intended recipient might check with the previous recipient to confirm if there was an authorised second opening for whatever reason before accepting the delivery. An amber condition might prevail if unauthorised opening within the permitted location but out of sight of the delivery point occurs hence the necessity of making the aforesaid check. Again should the amber lamp 17 become illuminated upon opening the doors at a delivery point, delivery should be refused since this would indicate unauthorised opening within the permitted location before arrival at the delivery point. A third opening in any permitted zone causes illumination of the red lamp 13.

The microprocessor clears down an amber condition at the first opening at any delivery point unless the amber condition prevails because of a third opening. All illuminated lamps can be cleared when the wagon "C" returns to its base.

Referring now to Figure 2 showing a second embodiment of the invention, a goods vehicle (not shown) has a goods receiving compartment provided with an access door or doors having a handle or the like for opening and closing the door. The handle operates a mechanism for maintaining the door closed until released by actuation of the handle. This mechanism may be a simple catch or latch mechanism or it may include a locking mechanism whereby the door can be locked and maintained in the locked condition until released by authorised personnel. The goods vehicle may comprise a van or a closed lorry or it may be trailer and traction unit combination.

The vehicle is fitted with a microprocessor unit 30 for storing data corresponding to a number of geographical zones to which goods deliveries and/or collections are made. The microprocessor unit 30 may, if desired, be programmed with the sequence in which the deliveries/collections are to be made at the stored zones. The geographical zone corresponding to the depot or base out of which the vehicle operates may also be programmed into the microprocessor unit 30. Such data may be in encrypted form to prevent unauthorised entry of zone data and may be entered through a hard-wired data entry input means 32 such as a key pad and/or may be entered, e.g. remotely, through a wireless link between a data entry input means and the microprocessor unit 30. The geographical zones may correspond to for example latitude and longitude positional coordinates, Ordnance Survey grid references or postal codes. A suitable form of door sensor 33 is associated with the door and is linked to the microprocessor unit 30 and the microprocessor unit is programmed to track the condition of the door, i.e. closed or open.

The vehicle is also provided with a tracking device 34 which allows the actual geographical location of the vehicle to be determined at any time. The tracking device 34 is linked to the microprocessor unit 30 to provide an output to the latter representing the actual geographical location of the vehicle. The tracking device 34 repeatedly determines the geographical location of the vehicle and may output corresponding data to the microprocessor on a continuous or quasi-continuous basis. Thus, by comparing the stored location data with the tracking device 34 output, the microprocessor is able to determine whether or not the vehicle at any given time is within a predetermined authorised zone.

The tracking device 34 may comprise a known type of vehicle global positioning system of the type currently in use and typically comprises a receiver and antenna for receiving and processing signals from satellites in orbit around the earth and thereby determine the actual geographical location of the tracking device 34 and hence the vehicle in which it is installed. However, other methods of tracking actual vehicle

location are not excluded. For instance, the tracking device 34 may rely on positional information derived from a cellular telephone network, making use of the fact that current technology allows the geographical location of a mobile phone to be determined from communications picked up by antennae located at different locations within a radio network, e.g. a cellular telephone network. Although in the illustrated embodiment, the microprocessor unit 30 and the tracking device 34 are shown as separate items, they may be accommodated either as separate units or in integrated form within the same housing which may be located at a convenient location within the vehicle, e.g. the driver's cab.

The microprocessor unit 30 forms a compartment status verification means and for this purpose is linked to a user-actuable switch 36, e.g. in the form of a push-button actuated switch. The push-button 36 (referred to below as the "interrogation button") is located at a suitable position on the vehicle, e.g. in the vicinity of the access door handle. Typically, this button is labelled with a legend such as "Press here before opening". The verification means also includes a number of signalling devices, e.g. lamps, which serve to provide a human discernible indication of the "sealed" status of the access door. In one implementation of the invention, three lamps are provided representing the following status conditions:

Lamp L1: "Door seal OK. Load acceptable"

Lamp L2: "Door sealed for next delivery"

Lamp L3: "Door seal broken. Check before accepting load"

These legends may be positioned alongside each lamp so that a recipient taking delivery of goods can inspect the status of the access door. The lamps will be sited for viewing at the time of accessing the vehicle goods compartment, e.g. on or adjacent the access door(s).

Although, for convenience, this embodiment of the invention will be described below in the context of using lamps to provide visual verification of the sealed status of the door, it will be appreciated that other forms of signalling device, usually

visual and/or audible, may be employed. For example, status may alternatively be signalled by means of acoustic signals such as different buzzing sounds corresponding to respective sealed status conditions. Alternatively, each status may be signalled by means of a pre-recorded spoken messages corresponding to the different status conditions.

In this patent application, reference to "sealing" of the access door is to be construed as referring to the circumstances under which door closure is effected rather than to physical sealing of the door. However, sealing of the door may but need not necessarily be accompanied by physically locking of the door, e.g. with the aid of a key or the like. Thus, in the implementation just referred to, if lamp L1 is lit, this indicates the status whereby the access door can be opened for the purposes of unloading or partially unloading the vehicle provided that the vehicle at the time is located within a geographical zone where unloading of the particular goods in question can take place. If lamp L2 is lit, then this indicates the status whereby the access door has been closed following loading or unloading of goods and the vehicle is in readiness for travel to the next authorised destination or geographical zone. If lamp L3 is lit, this indicates the status whereby an unauthorised opening of the access door has occurred and that caution must be exercised in taking delivery.

The status indicating lamps L1 to L3 are controlled by the microprocessor unit 30 in dependence on the preceding loading/unloading activity and the geographical location of the vehicle. The appropriate lamp may initially, under the control of the microprocessor unit 30, light up on change of status and may then extinguish until the interrogation button 36 is actuated at the next delivery/collection zone.

The microprocessor unit 30 is also linked to a second switch 38 which may be a push-button operated switch (referred to below as the "reset button") which may be labelled with a legend such as "Press button before closing door to ensure the load is

sealed for next delivery". This button may be located internally of the goods compartment of the vehicle so that it is only accessible while the door is open. Alternatively it may be provided at a location which is external to the compartment. Actuation of the switch 38 advises the microprocessor that compartment sealing is required upon completion of goods loading or unloading at the current geographical location.

A typical collection/delivery regime would be as follows. At the distribution depot (e.g. a supermarket distribution warehouse), the vehicle is loaded with goods to be delivered to one or more delivery points (e.g. supermarket stores). When loading has been completed, the person responsible for loading will actuate the "reset" button 38 at the time of closing/sealing the access door. Until the reset button 38 is actuated, operatives may repeatedly go into and out of the compartment and close and open the door. The sealing status of the compartment is unaffected until the reset button is actuated. At that point, in response to actuation of the reset button 38, the microprocessor will register the fact that the door has been or is about to be closed with the intention of sealing the compartment. Nevertheless if, at that point, the door is not closed, the microprocessor unit 30 may then remain in a standby condition awaiting signalling of actual door closure by the door sensor 33. Once this signal is received, the microprocessor unit causes lamp L2 to light up to indicate that the door has been properly sealed in readiness for the next delivery. Also, at this time, the microprocessor unit 30 will register the fact that it is at an authorised location, namely the depot. On leaving the depot zone, the microprocessor unit 30 will, through the tracking device 34, register when the vehicle leaves the geographical zone in which the depot is located and is therefore in a region where "breaking" the door seal is not authorised. At that time, the lamp L2 may be extinguished in response to leaving the authorised zone and the microprocessor unit 30 is arranged to automatically register the status "Door seal OK. Load acceptable".

Means (not shown) may be provided for signalling to the system whether or not the vehicle is in motion and/or whether or not its engine is running. Such means may for example comprise a motion detector or may be associated with or incorporated in the vehicle ignition switch. In order to detect motion, the system may make use of the tracking device, motion being detected in this case from changes in the positional co-ordinates of the vehicle as registered by the tracking means. The signal derived from such the motion detecting means may be used by the system to detect failure to operate the reset button 38 at the time of closing the door. Thus, for instance, if the door is sensed to be closed by the microprocessor unit (via door sensor 33) and the vehicle engine is started and/or begins to move, failure to operate the reset button 38 is detected by the microprocessor unit which may operate a suitable warning device to alert the driver and/or other personnel that the door has not been properly sealed thus enabling this to be rectified before the vehicle continues on to the next delivery/collection zone.

After departure from the depot, normally the vehicle is driven to the first delivery location which will have been programmed into the microprocessor unit 30. If the interrogation is then actuated at that location, the microprocessor unit 30 will verify that the vehicle is at the correct geographical location and cause lamp L1 to light up to indicate that the door seal has remained unbroken (viz. no unauthorised access to the goods compartment has occurred) during transit of the load from the depot thus giving the recipient of the delivery confidence that his delivery can be unloaded in the knowledge that it has not been tampered with or contaminated in any way since leaving the depot. To ensure that the interrogation button is operated before any attempt to access the goods compartment is attempted, the system may be arranged to produce a warning alarm in the event that an attempt is made to open the door before the interrogation button is pressed. For instance, means may be provided for detecting contact being made with the door handle (or the hand coming into close proximity to the door handle), such means being monitored by the microprocessor unit 30.

If, after leaving the depot zone and before arriving at the first intended delivery location, the access door is opened (for instance by someone intent on pilfering or otherwise interfering with the load), this will be registered by the microprocessor unit 30 and will be deemed to be an unauthorised opening (breaking of the door seal). When the vehicle ultimately arrives at the intended location of delivery, in response to actuation of the interrogation button 36, the microprocessor unit 30 will cause lamp L3 to light up, indicating that the door seal has been broken and that a check should be made before taking delivery. Such check may for instance involve a phone call to the depot.

Given that the extent of the area of an authorised geographical zone may need to be relatively large (e.g. 100 square metres) because of the resolution and other limitations of location tracking systems (e.g. poor coverage due to building interference), another situation that may arise is one where the vehicle arrives in an authorised zone with the microprocessor unit 30 registering the "Door seal OK, Load acceptable" status but, while out of sight of the intended recipient, the interrogation button 36 is actuated and the door opened, e.g. by the vehicle driver in an effort to defeat the system. In this event, after door closure (e.g. following interference with the goods), the microprocessor unit 30 will cause lamp L2 to light since, to all intents and purposes, it would appear that an authorised delivery had been made. However, when the driver then makes contact with the intended recipient at that location, because the vehicle has not left the authorised zone, lamp L2 will remain lit or will light up in response to actuation of the interrogation button 36 by the intended recipient. Because lamp L1 is not lit up, the recipient will be made aware that proper procedure has not been followed and may therefore instigate enquiries to establish whether or not delivery of the goods should be accepted.

In the above scenario, the driver could attempt to defeat the system by exiting the authorised zone and then re-entering the same authorised zone. This may be excluded by programming the microprocessor unit 30 so that re-entry into a given

authorised zone is permitted only once within a predetermined time interval. In practice, daily delivery routes only involve only a single drop-off/collection at any particular authorised zone during the course of one day and, consequently, in many situations, the predetermined time interval may (with the possible exception of return to the depot) be say 8 hours - corresponding to the number of hours in a typical working day. However, it will be understood that the time interval will in practice be dictated by circumstances.

Upon completion of unloading of the vehicle at the first delivery location, the "reset" button is actuated and the microprocessor unit 30 records the status "Door sealed for next delivery" with accompanying energisation of lamp L2 to provide a visual indication of this status. At the next authorised delivery location (as pre-programmed into the microprocessor unit 30), on actuation of the interrogation button 36, the microprocessor unit 30 will energise lamp L1 unless in the meantime the door seal has been broken. In the latter case, the microprocessor will on actuation of the interrogation button 36 energise lamp L3 to indicate that the door seal has been broken and that the intended recipient should make enquiries with the depot or the previous delivery location in order to determine whether or not the delivery should be taken. Likewise, if the door seal has been broken while the vehicle was within the zone covered by the second delivery location, as described above when the intended recipient actuates the interrogation button 36, lamp L2 rather than lamp L1 will light up thereby indicating the need for further enquiries to be made.

The above process will be repeated at each successive pre-programmed delivery/collection point, including the depot on completion of a delivery/collection journey and return to the depot. It will be appreciated that at some authorised locations, collection of goods may occur (and hence loading of goods into the vehicle) may take place rather than delivery of goods.

It will be seen that the system allows for only one operation of the reset button 38 (effectively the door-resealing button) in a permitted location. If the reset button 38 is operated twice in one location, then lamp L3 will light up when the interrogation button 36 is next operated. Once lamp L3 has operated, the arrangement may be such that the system must be re-initialised by authorised personnel. Re-initialisation may be restricted to authorised personnel using appropriate security devices; for instance, the reset button 38 may have a key-switch associated with it such that on operating the reset button 38 with the appropriate security key inserted (available only to authorised personnel), the microprocessor unit 30 is re-initialised and on door sealing then registers the status "Door sealed for next delivery". The security key may take various forms, e.g. it may be mechanical, an electronic key, a magnetic card, a radio frequency tag, a keypad or a wireless controller, and may for instance be programmed with a security code so that it can only be used once, or for a given period of time, before its security code automatically expires. This affords additional security since if an operator was to remove the key or card from the permitted location, it would expire before it could be used in an unauthorised fashion. Programming or coding of the key or card may be implemented by insertion into a programming unit 30 provided at secure point at the permitted location. The programming unit 30 may be so arranged that it is disabled in the event that any unauthorised attempt is made to remove it from the location at which it is commissioned.

Opening and/or closing of the access door (or enabling of door opening and/closing) may be sensed in various ways; for example, high security door switches (magnetic reed switches). In one arrangement, door security may be provided by way of a flexible cable associated with the door handle such that the cable interferes with door opening until disconnected and an electronic circuit may be provided to sense disconnection and reconnection of the cable and thereby provide a signal for transmission to the microprocessor unit, which signal indicates when the door is closed and when it

is either opened or enabled for opening. The cable may be a steel cable or it may be an electronic or fibre-optic cable.

The microprocessor unit 30 is typically arranged to record and retain data for subsequent analysis and may therefore record all door movements, operations of the various user-actuated components (including the interrogation button 36, the reset button 38, the security arrangement for re-initialising the microprocessor) together with the geographical zones in which such operations/movements occurred, the personnel carrying out the operations/deliveries/collections (i.e. where the system involves identification of the users by way of an electronic key or the like) and the times and dates involved. A communications system may also be provided so that data registered and recorded by the microprocessor unit 30 may be transferred by a wire or wireless link to a remote location, e.g. a central monitoring station/computer at the depot or elsewhere. The microprocessor unit 30 may be housed within the driver's cab and may be connected by wiring or by wireless connections (e.g. a radio link) to the hardware associated with the door sealing (i.e. the interrogation and reset buttons 38, lamps, etc). A wireless link is preferred in the case where the vehicle comprises a tractor unit 30 with a coupled goods trailer.

It will be appreciated that it is not intended to limit the invention to the above examples only, many variations, such as might readily occur to one skilled in the art, being possible, without departing from the scope thereof.

For example, instead of a door sensor being used, the door handle and/or keep may be rendered secure by means of a steel cable or electronic sensing cable (such as an fibre optic cable or an electrical conductor) which must be disturbed in order to open the door. In one form, the cable is passed through the door retaining handle and keep and pulled tight. Each end of the cable is then connected through a secure sensing switch to the microprocessor unit in such a way that the door can only be opened by

releasing one end of the cable. Release of the cable in this way is then sensed by the microprocessor unit and the door may be registered as being open or ready for opening until the cable is reinstated to its door securing condition.

In another modification, the interrogation button and the reset button may be constituted by the same switching device rather than two separate switching devices as illustrated in Figure 2, thereby reducing costs. In this event, the microprocessor unit 30 can readily differentiate between switch operations corresponding to "interrogation" and those corresponding to compartment sealing.

## CLAIMS

1. A security system for a goods delivery and/or collection vehicle having a goods receiving compartment, said security system monitoring and/or controlling access to the compartment and comprising means for verifying the geographical location of the vehicle and access status-registering means responsive to the location verifying means for determining whether or not the vehicle is within an authorised location and for indicating the access status of the compartment.
2. A system as claimed in Claim 1 in which, following sealing of the compartment at one authorised location, the arrangement is such that the registering means indicates the compartment access status upon arrival at the next authorised location.
3. A system as claimed in Claim 2 in which the indication of compartment access status is effected automatically on arrival at the next authorised location or is effected in response to operation of an interrogation switch forming part of the system.
4. A system as claimed in any one of the preceding claims in which the access status is selected from:
  - a first status corresponding to maintenance of compartment integrity since the last authorised access to the compartment; and
  - a second status corresponding to loss of compartment integrity since the last authorised access to the compartment.
5. A system as claimed in Claim 4 including a further access status which is set at an authorised location and indicates that, following sealing, further access to the

goods compartment is not authorised until the vehicle arrives at another authorised location.

6. A system as claimed in Claim 5 in which the registering means is operable automatically to change said further status to said first status when or after the vehicle leaves the corresponding authorised location.

7. A system as claimed in any one of the preceding claims in which the system is arranged to detect re-entry into a given location within a predetermined time interval following exit from that location.

8. A system as claimed in any one of the preceding claims in which the system includes means for recording a number of predetermined authorised geographical locations, means for tracking the current geographical location of the vehicle and means for comparing that location with said predetermined locations.

9. A system as claimed in any one of the preceding claims in which the system includes vehicle usage means for detecting when the vehicle is in motion and/or is about to be driven.

10. A system as claimed in Claim 9 in which the system is arranged to operate a warning alarm in the event that the vehicle is started or set in motion in the absence of a request for sealing of the compartment.

11. A system as claimed in any one of the preceding claims which the system is arranged so as to verify that the vehicle is present at a predetermined authorised location at the time that access to the goods compartment is required.

12. A system as claimed in any one of the preceding claims in which a closure member is provided for controlling access to the compartment and in which the system includes means for sensing opening and closing of the closure member.
13. A system as claimed in Claim 12 in which the system is arranged to provide an access status output indicating that, following a request for sealing of the compartment upon completion of loading and/or unloading at one authorised delivery/collection location, the closure member has been restored to its closed position and that re-opening of the closure member is not authorised until the vehicle is present at a different authorised delivery/collection location.
14. A system as claimed in Claim 12 or 13 in which the system is arranged to provide an access status output indicating that the closure member has been re-opened while the vehicle was not present at a predetermined authorised location and/or was not present at a predetermined authorised location different to that at which the compartment sealing was last established.
15. A system as claimed in any one of the preceding claims in which the system is arranged to produce a visual and/or audible output for each access status.
16. A system as claimed in any one of the preceding claims in which the system is arranged to indicate the prevailing access status in response to actuation of switch means associated with the vehicle.
17. A system as claimed in any one of the preceding claims in which the system is programmable with a number of authorised locations and the order in which they are to be visited whereby any deviation from the programmed itinerary is detected.

18. A system as claimed in any one of the preceding claims in which the registering means comprises a microprocessor unit.
19. A system as claimed in any one of the preceding claims in which the location verifying means includes a global positioning system receiver.
20. A system as claimed in any one of Claims 1 to 18 in which the location verifying means is arranged to communicate with a radio communications network so as to receive signals indicating vehicle position.
21. A vehicle security system comprising an indicator means, a microprocessor, means which delivers a signal to the microprocessor each time the doors of the vehicle are opened or unlocked to enable opening, the microprocessor being programmable with the coordinates of locations where opening of the vehicle doors is permitted, tracking means for updating the microprocessor with the coordinates of the position of the vehicle, the microprocessor being programmed to operate indicator means whenever the doors of the vehicle are opened or enabled for opening other than at a permitted location.
22. A system as claimed in Claim 21 in which the microprocessor is programmed to operate said indicator means if the doors of the vehicle are opened or enabled for opening more than once at a permitted location.
23. A vehicle security system substantially as hereinbefore described with reference to, and as shown in, Figure 1 or Figure 2 of the accompanying drawings.



Application No: GB 0016439.2  
Claims searched: All

Examiner: Simon Berry  
Date of search: 13 December 2000

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): E2X (X7X); H4D (DAB, DPBC)

Int Cl (Ed.7): B60R 25/10; G01S 5/00, 5/14; G08G 1/123, 1/127

Other: ONLINE DATABASES: EPODOC, WPI, JAPIO

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
A	GB 2318008 A (MINORPLANET LIMITED) Vehicle location monitor. Sensors indicate body door opening (page 6, lines 23 to 24).	
X	GB 2219904 A (SECURITY SERVICES PLC) Security system for container lock control. See whole document, for example page 5, lines 19 to 25.	1-3,8,9,12 13,15-21
X	US 5826195 (HIGHWAYMASTER INC.) See whole document, especially col. 7, lines 12 to 16, col.8 line 22 to 53 and col. 16, lines 20 to 25.	1-4,12,15 16,18-21

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X Document indicating lack of novelty or inventive step	A Document indicating technological background and/or state of the art.
Y Document indicating lack of inventive step if combined with one or more other documents of same category.	P Document published on or after the declared priority date but before the filing date of this invention.
& Member of the same patent family	E Patent document published on or after, but with priority date earlier than, the filing date of this application.